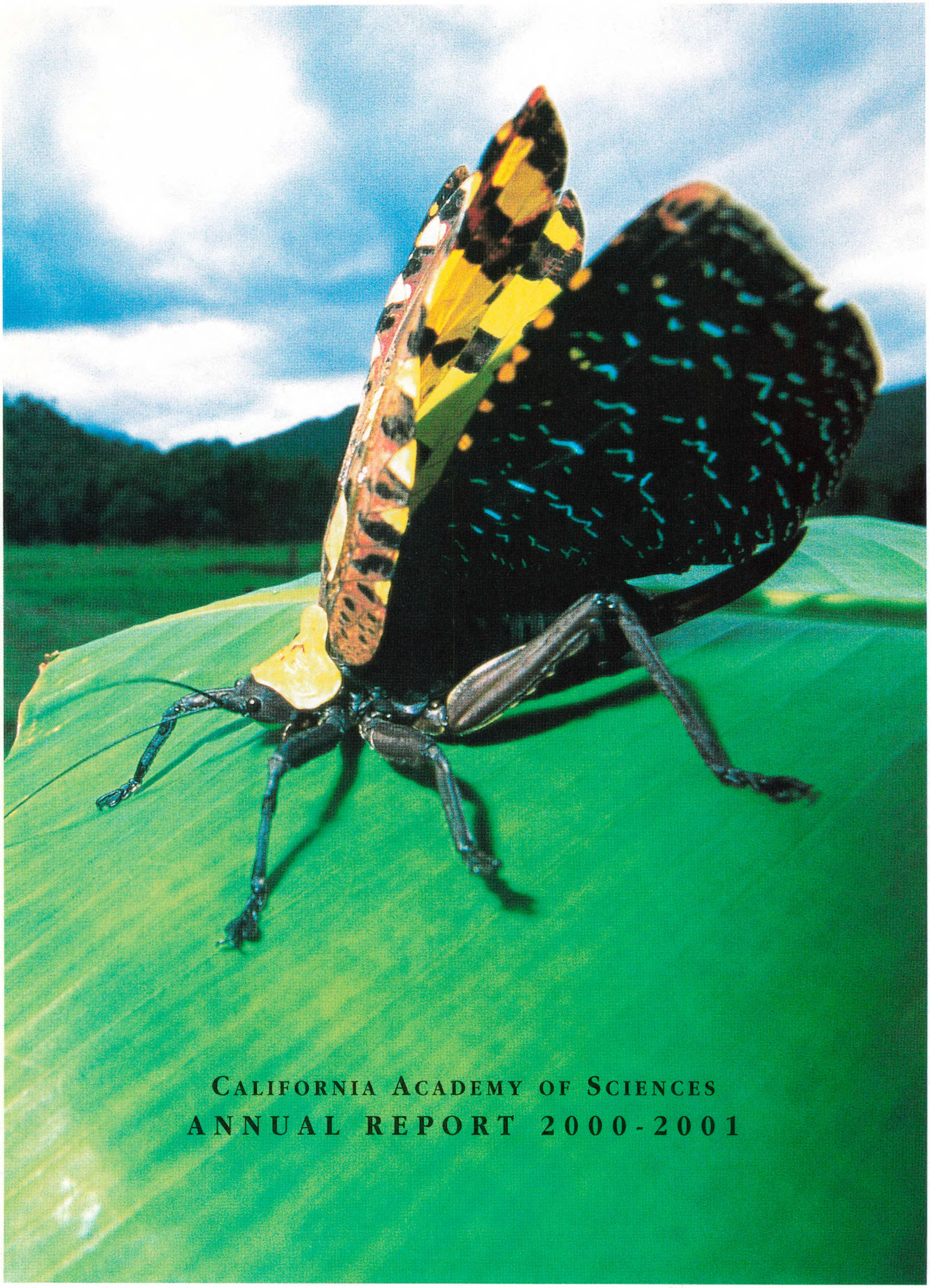
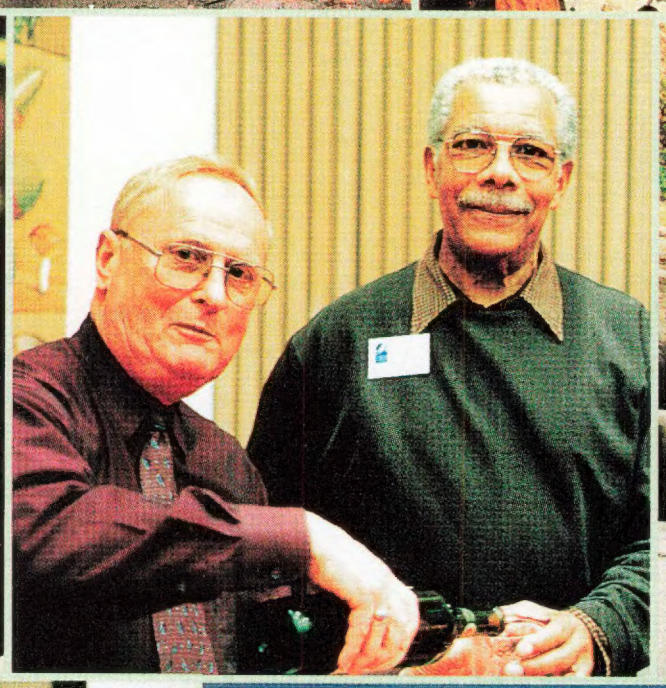
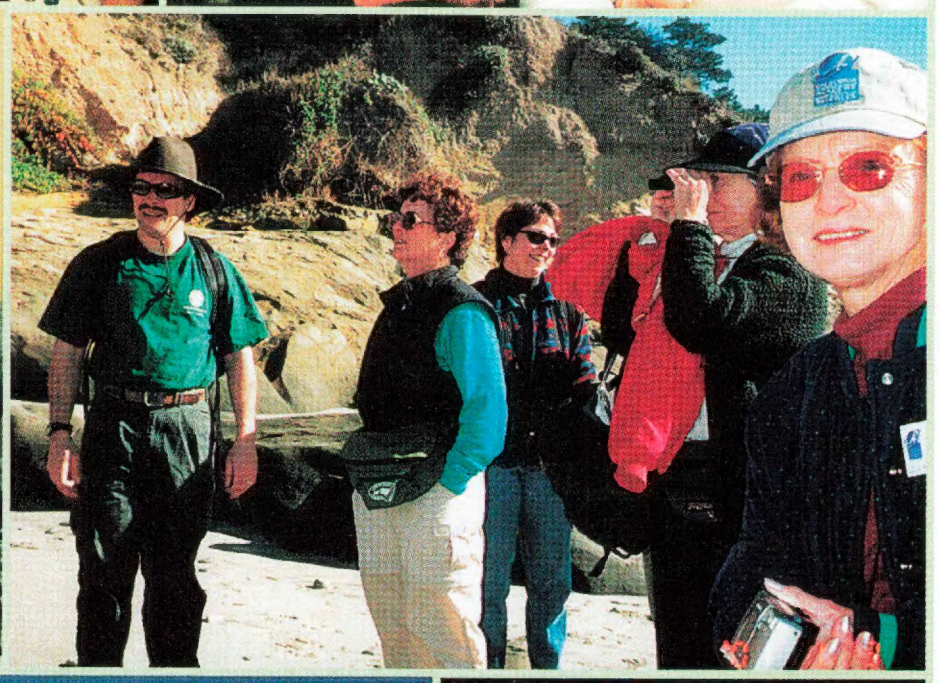


# CALIFORNIA ACADEMY OF SCIENCES
# ANNUAL REPORT 2000-2001





*Enthusiastic volunteers and staff enhance the Academy's mission.*

Cover: *Long-horned Grasshopper* (Tettigoniidae) *photographed during an Academy expedition to Myanmar.*

THE CALIFORNIA ACADEMY OF SCIENCES IS UNIQUE. It combines the three elements found on the public floor—a museum, an aquarium, and a planetarium—with a scientific institution dedicated to discovering, describing, and categorizing the plants and animals of the world. With seed money provided from bonds approved by the citizens of the City and County of San Francisco to restore the seventy-five-year-old Steinhart Aquarium and the Natural History Museum, we made the commitment two years ago to rebuild the Academy as a world class, state-of-the-art building and exhibit space.

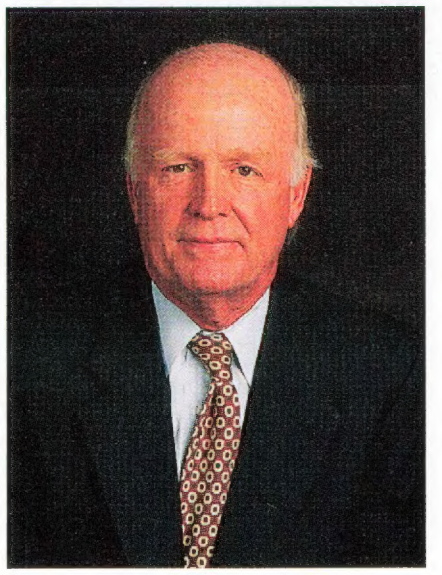
Essential to this process has been the necessity to coordinate an exciting, awe inspiring building with exhibits and displays that will enhance the visitors' experience. After reviewing proposals from some of the world's leading architects, we selected Renzo Piano, winner of the 1998 Pritzker Prize, architecture's premier award, as the principal architect of the new building. Piano's preliminary work shows a design that will be innovative, environmentally responsible, and one that will blend unobtrusively with the beautiful setting of Golden Gate Park. We are also committed to ensuring that the Museum's content and its display will match this stimulating building. For our ambitious ideals to succeed, the three pillars of the institution—Research, Education, and Exhibition—will be integrated and focused toward a unified goal. Aided by three external design teams who are coordinating closely with the Academy's scientific and exhibit staff, we are creating an unparalleled institution, one that will demonstrate the value and importance of the natural world, and that will serve as a beacon for future generations grappling with scientific discovery in all its many manifestations. We expect to make our plans public in mid-2002.

While we have devoted considerable efforts to build the Academy of tomorrow, programs of the Academy of today continue to run smoothly. We have expanded our overseas research with a base of operations established in Madagascar and a full-scale expedition to the islands of São Tomé and Príncipe in the Gulf of Guinea. Our work with students from elementary school through to post-graduate interns continues and expands. Our programming on the public floor offers nearly daily programs while the vitality of our exhibits has been enhanced with the new "ScienceNow" displays. These are assembled by a rapid-response team and enable us to react to news events within one to two weeks while they are still current.

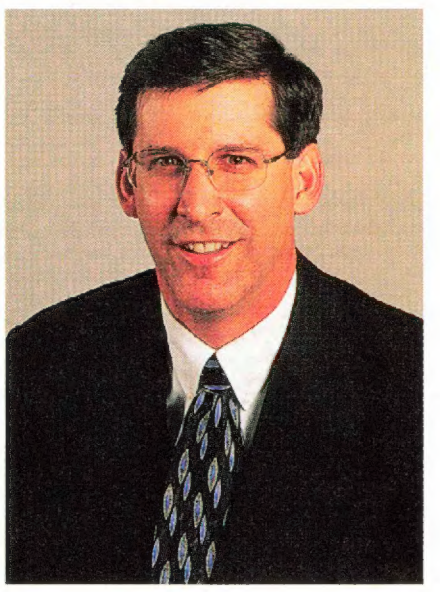
We will look back on this year as a milestone in our history. Tremendous strides were made to envision the new Academy and to forward our work of scientific research and the public's understanding of science. Decisions were made that will affect our path and our role in the scientific education of the Bay Area for decades.

W. RICHARD BINGHAM
*Chairman, Board of Trustees*

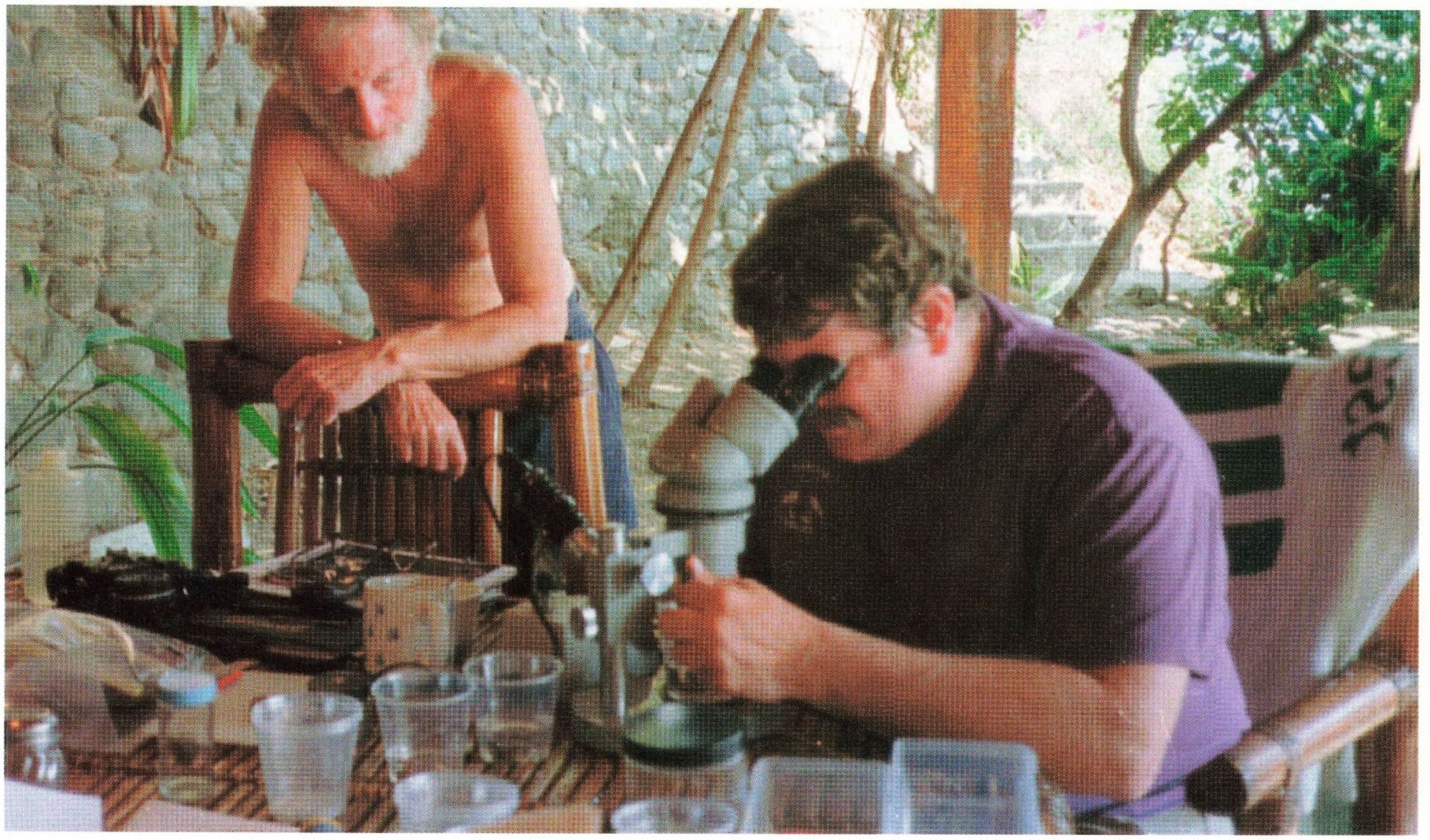
J. PATRICK KOCIOLEK, PH.D.
*Executive Director* and *William R. and Gretchen B. Kimball Chair*



*Chair of the Board of Trustees*
W. RICHARD BINGHAM



*Executive Director*
J. PATRICK KOCIOLEK, PH.D.

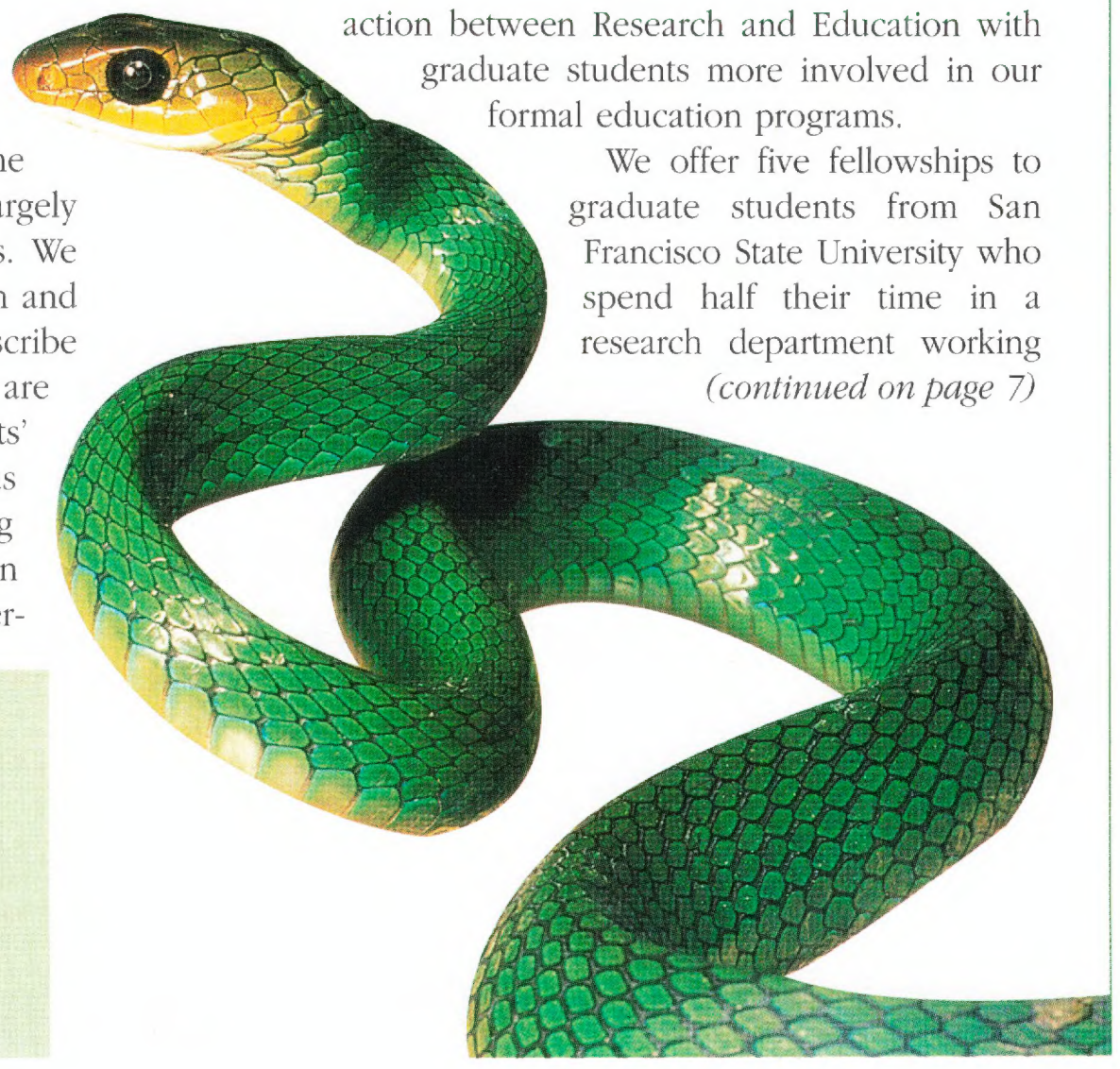


*Provost Dr. Terrence Gosliner, who oversees much of the day-to-day running of the Academy, still finds time for his research passion, marine invertebrates. Among his responsibilities are the exhibits, including the successful "Venoms: Striking Beauties."*

## Public Programs

### Terry Gosliner, *Provost*

Much of the staff's collective energy has focused on planning for a remodeled California Academy of Sciences. The new Academy will be significantly more integrated across the institution's divisions, and this last year was devoted largely to exploring how we can develop cohesive programs. We have been building-up our capacity for this integration and constructing a framework of principles that will prescribe what the Academy will become. At the same time, we are beginning to achieve some of these goals. Our scientists' research is becoming more collaborative, and hence has greater impact. Our curators and other staff are devoting much of their time to the training of the next generation of scientists. As a consequence, there's much more interaction between Research and Education with graduate students more involved in our formal education programs.



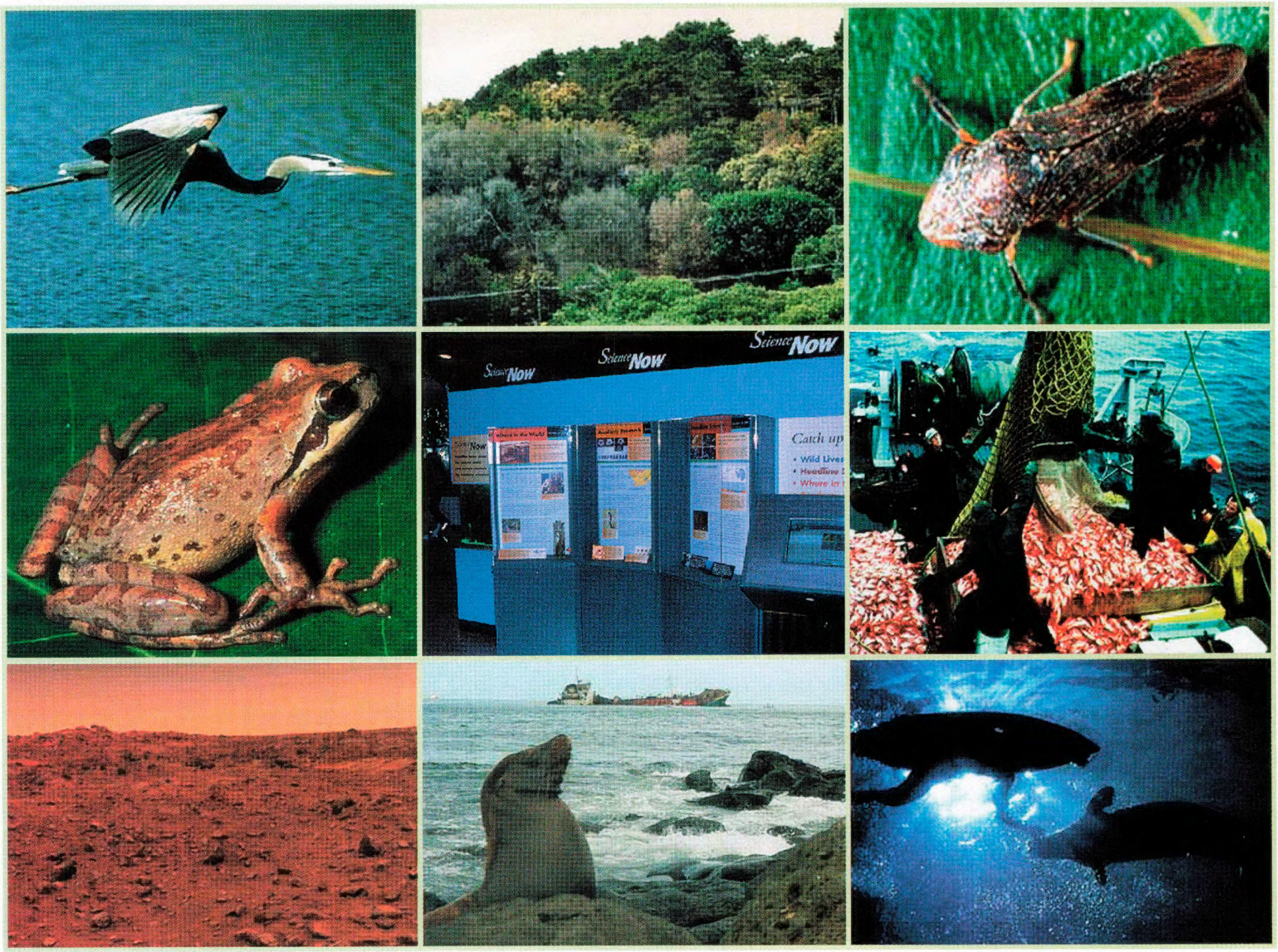
We offer five fellowships to graduate students from San Francisco State University who spend half their time in a research department working

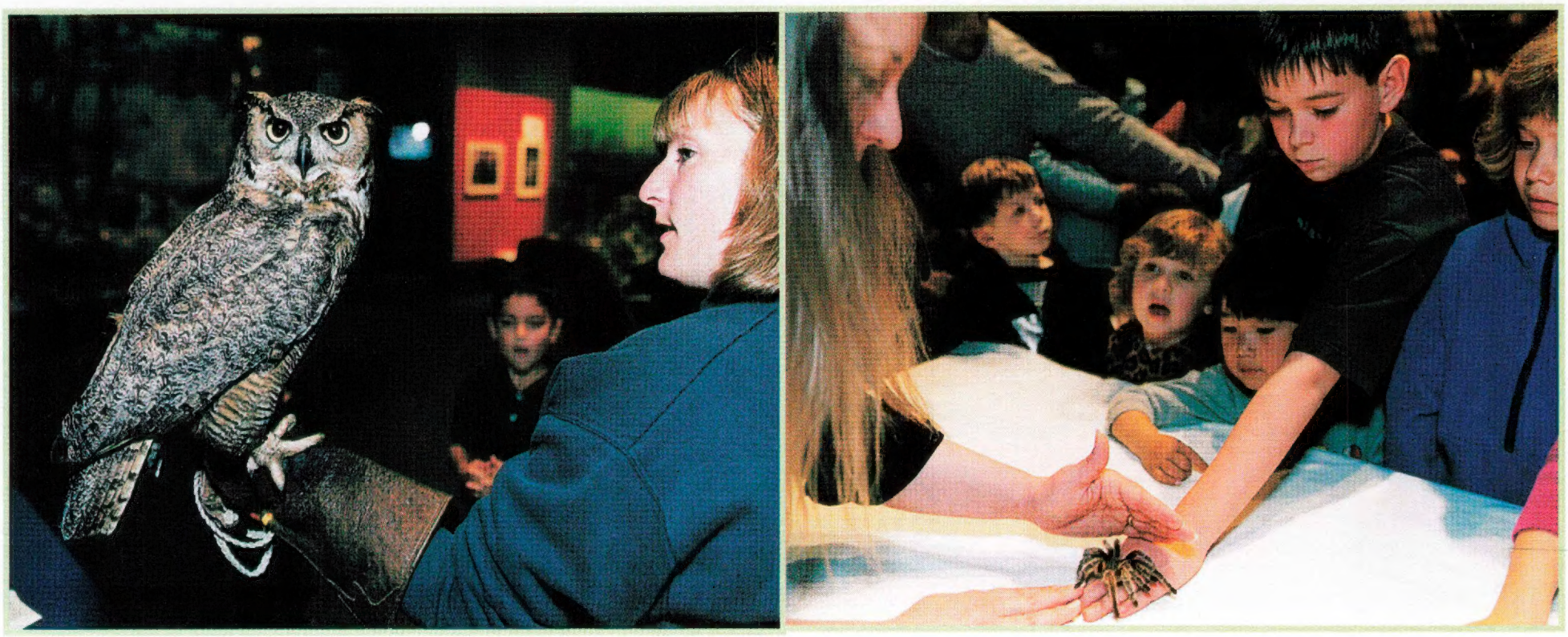
*(continued on page 7)*

***Exhibits***

- **Venoms: Striking Beauties**
- **Rural Traditions—A Day of the Dead**
- **ScienceNow–*New exhibits each week***
- **At Home in Vanuatu: Tradition in the Western Pacific**
- **Audubon's Birds of America**
- ***California Wild* Photo Contest Winners**
- **Survivors of the Desert**

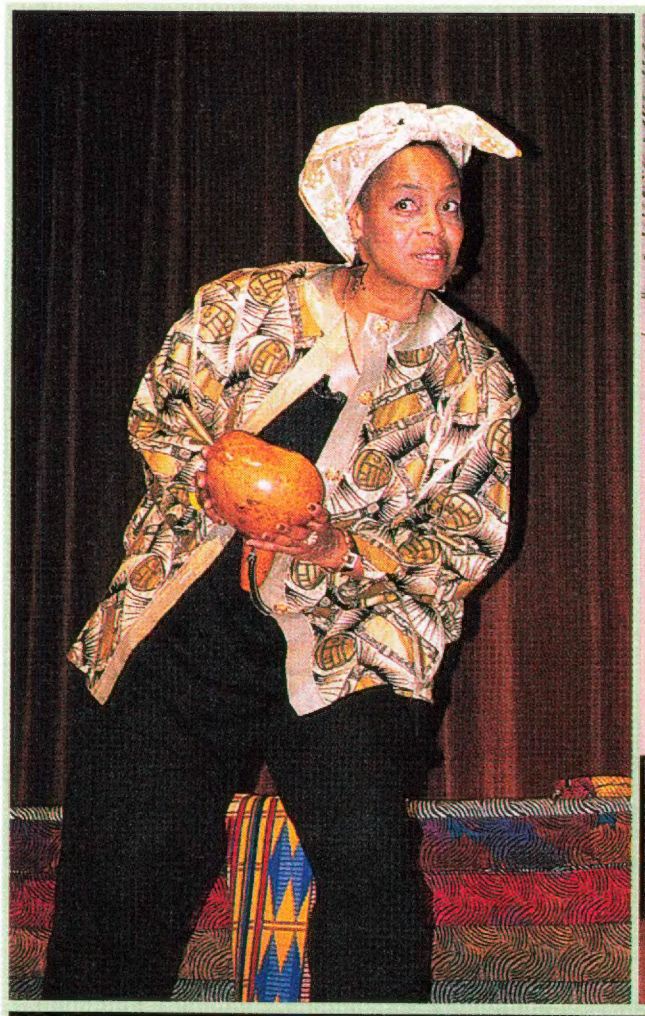
The ***ScienceNow*** Exhibit is one of the many new Academy public programs.



Top: *The new, constantly-changing ScienceNow kiosk (center) surrounded by images from various exhibits.*

Bottom: *Unusual Academy visitors.* Left: *A great horned owl, part of a Birds of Prey presentation during the Audubon Birds in America exhibit.* Right: *Kids get up-close with a tarantula.*



**Special Events**

- Black Heritage Month
- Latino Heritage Month
- American Indian Month
- American Asian-Pacific Heritage Month
- Earth Day
- Neighborhood Free Days

*Performers in our Traditional Arts Saturday series and Public Programs demonstrations. Storyteller Marijo shares tales from the African diaspora during Black History Month; Tezkatlipoka performs Aztec dances; Moloka'i's Moana Dudoit's Hula Halau; Ensemble Reflejos de Mexico from Jalisco.*

Opposite: *Cambodian classical dancer, Charya Burt.*

*(continued from page 4)*

with an Academy curator and thesis supervisor and half working with student interns, giving public presentations, and getting a broader perspective on how to disseminate their knowledge. When we look for new scientists to join our staff, we still insist on world-class research but we also want superb communicators. Today, this skill is an essential attribute to explain to broad audiences the significance and impact of our scientific work.

This year we introduced a new exhibit program "ScienceNow," which explains current news stories on the public floor each week. ScienceNow is produced by a team of people from many divisions and includes Exhibits, Aquarium, Education, Research, Library, and Communications staff. Together, they have created compelling displays about the natural world. These exhibits have featured breaking news events, new discoveries, and environmental catastrophes explaining, in many cases, the impacts on our lives. They might describe a strange creature that's washing up on a local beach or an unusual environmental or scientific event that has occurred somewhere in the world, such as the oil spill off the coast of the Galápagos or the presence of sudden oak death in our own backyards.

We want to bring a focus to those kinds of incidents and become a clearinghouse where people will come for current information about the natural world. The Library provides additional resources that enable visitors to peruse publications and Internet sites and a whole array of further information. In the new Academy we will be prepared for a level of interaction and cooperation that will build our capacity to develop information much faster and to bring it to the public with immediacy.

We've also begun to coordinate exhibits and programming for the public using a multidivisional approach. We saw effective results in our Earth Day event and through the various ethnic history "months"—Black History, Latino Heritage, American Indian Heritage, and, for the first time, Asian Pacific American Heritage Month—which have a modern culture outlook, and through our weekly Traditional Arts program. Science explainers and docents are an integral part of our public interface. Whether they join forces around an exhibit or an event like Charles Darwin's birthday or are focused on a celebration of a particular ethnic community, the different departments have coordinated to create presentations that are accurate, attractive, and compelling.

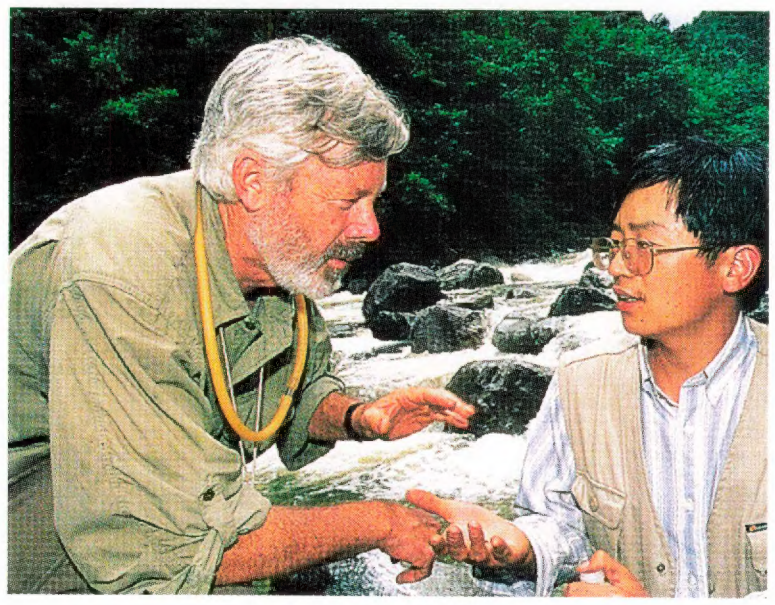
For example, we developed multifaceted programming around the Venoms Exhibit, the first large in-house exhibit in a decade, and one which involved people from all the Academy's areas and disciplines. *Venoms: Striking Beauties* also achieved some of the goals that we envisage for the future of the Academy by integrating a variety of media including living organisms, static displays and interactive exhibits. *Venoms* was an excellent beginning, and we plan to develop many more exhibits using this model.

| ***Visitation*** | |
|---|---|
| **Total number** | **792,072** |
| **School children attending free** | **62,770** |
| **Free Day attendance** | **100,483** |

*At Home in Vanuatu* was an exhibit that was first proposed to the Academy many years ago and was subsequently developed collaboratively between people in the South Pacific, and our Anthropology and Exhibits departments. It not only brought to light the highly traditional culture of the people of Vanuatu, a society that has chosen to ignore modern conveniences and most material goods, but it also turned out to be a two-way exchange. We brought Bosun, a villager from Vanuatu, who had previously never left his archipelago, here to the United States and the Academy. Back home he put on an exhibit of his photographs taken in the United States.

We've recently started the process of developing a new model for creating exhibits for the new Academy. It is one that involves external designers as well as the Academy's Exhibits Department, our scientists and educators, and the Aquarium and Planetarium staff. We are taking a fresh look at what should be on the public floor of a twenty-first century museum. There is no model for that anywhere. Prior to embarking on the design, we talked about what the Academy's goals are, what its values are and how we can build on the Academy's assets—its rich resources, its vast collections and intellectual capital. Looking at the traditional sources of ideas for exhibition design left us with a sense that they didn't present the kind of creativity we demand in the future Academy. We knew we would have to use different criteria and find different people, including designers and content-developers who had not traditionally created exhibits for museums. From that starting point we are determining the Academy's direction and content, which, in turn, will drive the building's external design. The new design team is tremendously excited at the opportunity of doing something with lasting value, delivering in a new and compelling way, something that is real and that has a foundation in integrity and educational value.

## DAVID KAVANAUGH, *Research Director*



As the pace of planning for the new Academy quickens, much of the efforts of the research department have gone into planning for the future. My colleagues and I have been going around the country visiting some 15 recently built or renovated facilities for collections and research. There has also been significant scientific input into the planning for the new institution's exhibits, which will parallel our research work more closely than they have in the past.

During the last year, we have had two very significant Academy-wide expeditions. In July, a team of botanists, entomologists, herpetologists, ichthyologists, and mammalogists traveled to the Gaoligong Shan in western Yunnan, China, to inventory the plants and animals of this isolated mountain range. This expedition was sponsored by members of the San Francisco Bay Area Chinese-American community and the National Geographic Foundation; it also acted as a catalyst to bring together scientists from various Chinese institutions and helped train many Chinese students in systematic fieldwork. The several thousand specimens that were collected will be studied in both San Francisco and China. Among the specimens we found was a micro-orb weaver spider of the family Symphytognathidae, which represented the first record of the family for China. Dr. Charles Griswold, Academy arachnologist, observed that these spiders lay their eggs along the edge of their web, an unusual location for spiders. Reproductive behavior for this family was previously unknown.

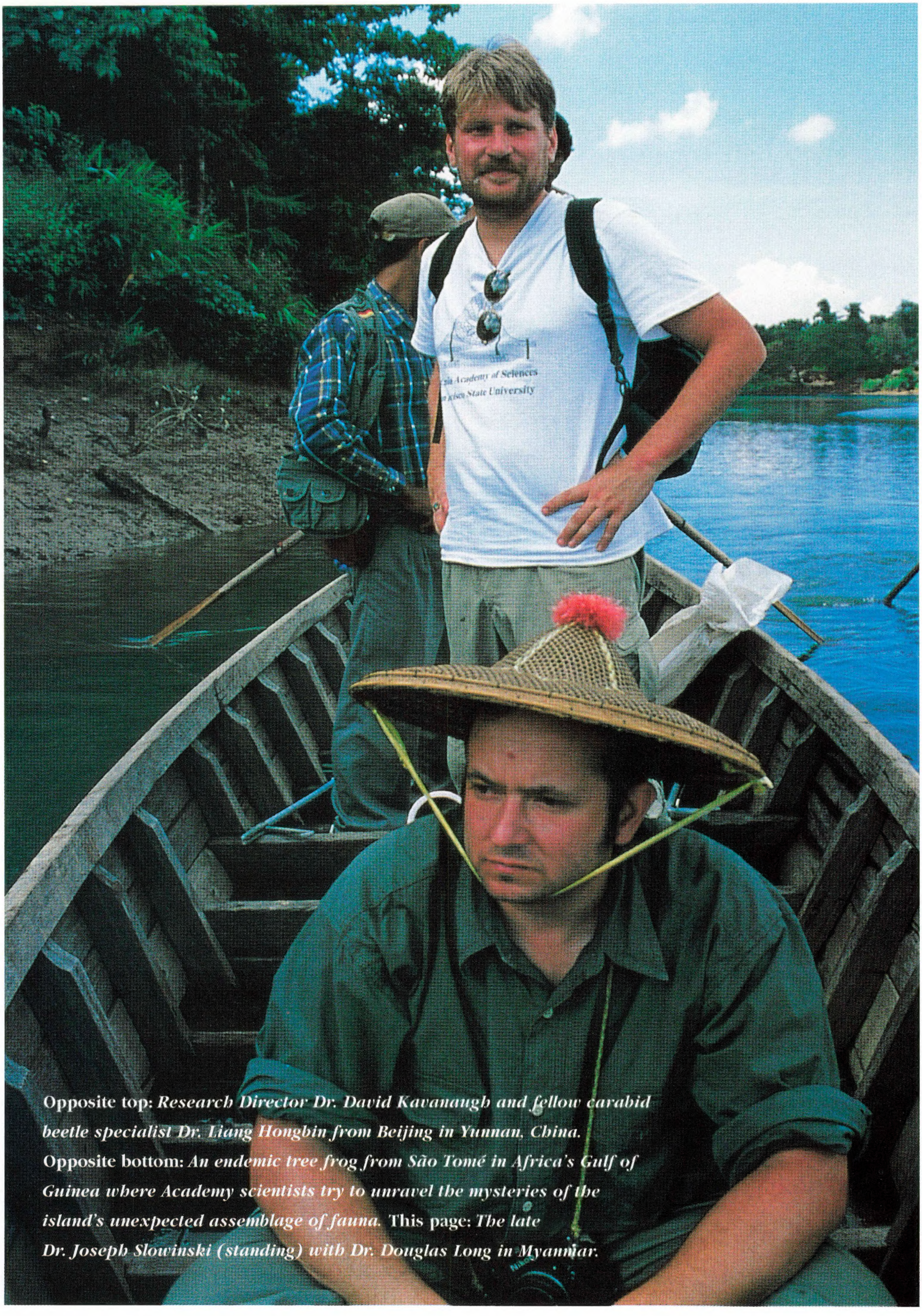
In the spring a second expedition, headed by herpetologist Dr. Robert Drewes, explored the Gulf of Guinea Islands of São Tomé and Príncipe. These small islands are part of a chain of volcanoes that include the island of Bioko and Mount Cameroon on the African continent. Again most of the major research departments were represented, with the addition of invertebrate zoologist Sarah Spaulding, who studies diatoms. No one had ever studied the diatoms of these islands before so there were many new discoveries.

Both the Yunnan and Gulf of Guinea expeditions were enhanced by having a photographer and scribe on hand to record events and day-to-day activities.

Entomologists Dr. Charles Griswold and Dr. Brian Fisher obtained a $400,000 grant from the National Science Foundation (NSF) for a comprehensive three-year study of arthropods throughout Madagascar. With the help of the MacBean Family Foundation, we have established a field research support facility in the capital Antananarivo where we have labs, storage areas, computer facilities and accommodations for visiting scientists. A number of Malagasy students have been trained in collection techniques. They have begun collecting and processing insects and spiders and already have over a million specimens. In the high plateau of Madagascar, Dr. Fisher discovered a species of ant he called "Dracula ants," because the queen ants only ingest hemolymph, or blood, from their own larvae.

We also had field teams of Burmese herpetologists, who were supervised by the late Dr. Joseph Slowinski, working through the year. A supplemental NSF grant has enabled us to begin the study of mammals, particularly bats and other small mammals, of Myanmar. Dr. Brian Fisher, an expert on the ants of Africa, was asked by the World Wildlife Fund to lead an expedition to the Central African Republic. The scientific results were exciting, but the team's escape from a country torn by civil war proved even more so. Their trials were recorded via daily reports on their website. Fisher and his colleagues eventually crossed into Cameroon by dugout canoe. During the year, Academy scientists working in 25 different countries found hundreds of new species which will take years to process, describe, and analyze.

Closer to home, Dr. Richard Mooi is heading the Academy's SFBay2K Project, which involves a team of researchers, college interns, teachers and high-school students who are conducting a four-year baseline study of the biodiversity of San Francisco Bay. Sampling takes place both from the shore and from a newly acquired 26' research vessel. Already they have recorded over 700 species, approximately one-third of them non-native. Jens Vindum and his colleagues have been surveying the herpetological species found in the Mendocino, Sequoia,



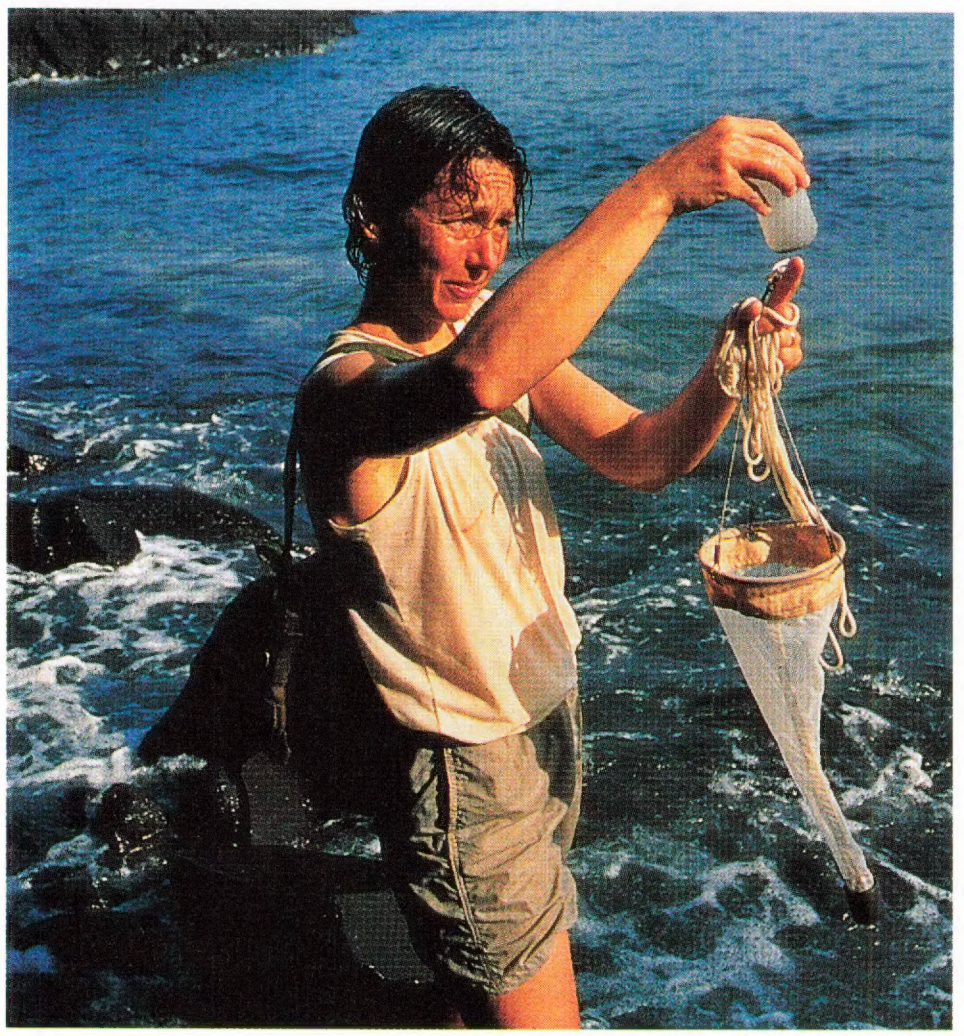

Opposite top: *Research Director Dr. David Kavanaugh and fellow carabid beetle specialist Dr. Liang Hongbin from Beijing in Yunnan, China.* Opposite bottom: *An endemic tree frog from São Tomé in Africa's Gulf of Guinea where Academy scientists try to unravel the mysteries of the island's unexpected assemblage of fauna.* This page: *The late Dr. Joseph Slowinski (standing) with Dr. Douglas Long in Myanmar.*

***Growth and Use of Collections in Research Departments 2000-2001***

| Department | Total specimens accessioned | Total specimens loaned | Total visitors |
|---|---|---|---|
| *Anthropology* | 76 | 259 | 33 |
| *Aquatic Biology* | n/a | n/a | n/a |
| *Botany* | 29,900 | 19,107 | 690 |
| *Entomology* | 98,177 | 28,743 | 915 |
| *Herpetology* | 7,082 | 1,282 | 256 |
| *Ichthyology* | 1,464 | 2,362 | 345 |
| *Invertebrate Zoology & Geology* | 19,149 | 2,973 | 90 |
| *Ornithology & Mammology* | 1,031 | 148 | 381 |
| **Totals** | **156,879** | **54,874** | **2,710** |

**Total holdings in all collections: 16,681,366**

and Sierra national forests. As a member of the nationwide marine mammal stranding network, the Academy, through its staff and associates, found 321 specimens along our local beaches, including sea lions, seals, porpoises, dolphins, whales, and a green sea turtle. And a longtailed weasel was discovered in San Francisco for the first time in 15 years.



The first person to occupy the new two-year Post-Doctoral Fellowship in entomology, established during the year and sponsored by the Schlinger Foundation, was Dr. Wang Xin Ping. We supervised sixteen masters students through San Francisco State and two doctorate students through the University of California, Santa Cruz. We employed eight Summer Systematics Institute and Wallace interns, students from all over the country studying for bachelors degrees and getting experience in systematic biology, each working with a scientist in one of our research departments. We also had thirteen Lakeside Fellows. These students or young professionals came to the Academy from developing countries, including Brazil, China, Costa Rica, Ecuador, Haiti, Malagasy Republic, Mexico, Peru and South Africa, and are supported by funds provided by the Lakeside Foundation.

This year our researchers and associates wrote 187 scientific publications. Significant among them were the first three volumes of Embia: Contributions to the biosystematics of the insect order Embiidina, by Dr. Edward S. Ross. These and subsequent works in the series are the culmination of a lifetime study by the world authority on this little-known order of insects. Dr. Charles Griswold's monograph on cyatholipids, a family of spiders found throughout the southern hemisphere that dates back to the time when the Earth's southern landmass consisted of a single continent, was also published. Dr. Tom Daniel, in conjunction with a colleague from the Philadelphia Academy of Sciences, received a substantial NSF grant to study the evolutionary relationships of Acanthaceae, the shrimp plant family. They have already published their first paper and plan several more.

Left: *Dr. Sarah Spaulding collects diatoms on São Tomé.*
Above and bottom: *Jumping spider and white-throated oxylabes, respectively, found in a Madagascar rainforest.*

*Education Department Chair Dr. Meg Burke on an expedition to the Galápagos Islands where the Academy is cooperating with the Charles Darwin Research Station.* Below: *Broad-lipped twayblade photographed during an Academy field trip to the Trinity Alps in Northern California.*

## Education

### Meg Burke, *Department Chair and Curator*

The goals of the new Academy can be summed up in three "I"s: Improvement, Innovation and Integration. Over the past year, we have already begun to meld Research, Education and Exhibits goals into our educational programs.

Everyone who comes through the Academy's doors has some type of educational experience. Whether it be for young children exploring specimens by touch, students studying dioramas, teachers attending workshops, or adults participating in seminars and lectures, our role is to enrich and enliven that experience.

This year we have made several exciting additions to our staff. Dr. Carol Tang, the new Assistant Chair and Senior Science Educator, has extensive experience as an educator but is also a geologist and active researcher. Her appointment is a further example of the strengthening ties between Education and the Research Division. We also hired Dr. Alejandro Acevedo-Gutierrez, a marine mammalogist, as our Senior Aquatic Educator. He will increase the educational programming for the Aquarium and for aquatic biology in general.

Roberta Ayres has also joined us as the educator for the SFBay2K Project, a research and education initiative that is inventorying the benthic (bottom-dwelling) animals of the Bay. Ms. Ayres originally hails from Brazil. Together with Drs. Tang and Acevedo-Gutierrez, she adds welcome diversity to the Education staff and the Academy's public face. All three have helped strengthen our efforts to reach traditionally underserved and underrepresented communities in the sciences.

With the administrative move this year of the Early Childhood Program to the Education Department, our programs now serve all ages, from toddlers to seniors. The Early Childhood Playspace and African Experience exhibit introduce pre-schoolers to the excitement of science with age-appropriate activities and materials. The youngsters exercise their curiosity and motor skills with puzzles, puppets, costumes, games and instruments or

enjoy quiet time with a story—all with an African natural history or cultural theme.

This year saw the pilot study of an innovative new program for fourth and fifth grade students called "Museum as the Classroom" (MAC). A collaborative effort between the Education and Exhibits staff, MAC introduced 24 students from San Francisco's Clarendon School to the concept of biodiversity. During 19 sessions, Academy staff guided the students in an exploration of biodiversity using the Academy's exhibits, collections and library resources. After a general introduction, the students chose reptiles as their focus topic and designed an exhibit they titled "Survivors of the Desert." The student-designed exhibit, which opened on Earth Day, was built by the Exhibits Department. The interactive, kid-friendly displays proved a magnet for children and taught us a lot about what appeals to youngsters and how they respond to exhibits. MAC is a good example of the integrative, innovative programming we are exploring for the new Academy.

Educational programs extend well beyond the walls of the Academy. One of our guiding principles is that if we want to help people understand and appreciate the natural world and help foster in them a sense of environmental stewardship, we must help them experience that world. This year Junior Academy, Camp Academy and Adult and Family Courses offered over 90 opportunities for people to experience the outdoors for a few hours to a week under the guidance of a natural history/environmental instructor.

Wild City!, our environmental education outreach program, provided opportunities for 696 fourth and fifth grade San Francisco students to explore local issues of biodiversity in a five-session format during both the academic year and summer. Wild City! participants explore natural areas such as Golden Gate Park, the Presidio's Mountain Lake, McLaren Park and San Bruno Mountain.

The Mountain Lake Research Project and SFBay2K Project combine research and education opportunities for targeted audiences not only to experience the natural world, but also to understand science as a process. At Mountain Lake, one of the few remaining natural freshwater lakes in San Francisco, middle school, high school and college students learn and apply scientific methods to monitor the lake's birds, reptiles, amphibians, plankton and water quality. In 2000/2001, over 175 students logged over 5,000 hours on the Mountain Lake Research Project. The National Park Service uses the information they collect to inform their management decisions. For instance, data collected by students demonstrated that the non-native eucalyptus trees were not critical to bird life at the lake and could be replaced by native willows to the overall benefit of the lake's ecosystem. The eucalyptus tree removal has already begun. In Spring 2001, the "citizen scientists" had an opportunity to present their findings and share their experiences at the first Mountain Lake Symposium.

Similarly, citizen scientists in the form of interns from our Careers in Science Program and teachers participated in the Academy's SFBay2K Project which debuted this year. In this survey of the biodiversity within the Bay, teachers and interns go through an orientation workshop and then work alongside Academy scientists in the field on collecting trips and in the lab processing the samples. In addition to learning about basic marine biology, the participants also discover how and why we collect and analyze specimens and data.

Our educational outreach has explored new and distant horizons. Environmental Educator Joseph Kinyon was invited to the Republic of Georgia by its parliament to explain how hands-on environmental education works and, using the

Left: *A vernal pool on the California Academy of Sciences' Reserve in the Trinity Alps in Northern California.*

Right: *Drawings featuring Cascade downingia made by instructor and environmental educator Joseph Kinyon during a field journaling class. The Academy organized some 135 adult and family courses throughout the year attended by nearly three thousand students of all ages.*

Left, top and bottom: *Interns and teachers participate in the SFBay2K Project, a new program surveying the biodiversity of San Francisco Bay.* Right, top and bottom: *Students in Camp Academy investigate the wildlife of Golden Gate Park in the field and lab.*

Mountain Lake Research Project as one example, show how a country with limited funds could use non-governmental organizations to help its fledgling park service. Careers in Science Intern Flor Vargas extended her research experience in the Academy's Entomology Department by being part of the research expedition to Madagascar. She now knows first-hand the joys and tribulations of intensive fieldwork in a remote area.

For many of our Education programs, the relationship between the participants and the Academy is mutually beneficial. Each year 30-40 Careers in Science Interns and Research Explainers learn basic science concepts, explore career and educational opportunities, and are mentored in research experiences by Academy staff and graduate students in a paid internship. This diverse group of young people also provides educational demonstrations on the public floor and make up the primary interpretive staff at the Touch Tidepool. Docents also receive in-depth, college-level training by Academy staff, and in turn provide Academy tours for school groups and the public. This year, 220 docents volunteered over 17,000 hours of their time, giving tours and demonstrations to over 15,000 students and the public. Almost 650 other volunteers donated over 26,000 hours of their time to help keep the Academy running by performing an amazing variety of tasks. These range from working at the Information Desk, to answering questions at the Biodiversity Research Center, to helping out in the research departments, to donning scuba gear to scrub algae from fish tanks.

Education at the Academy is a dynamic, multifaceted and rewarding enterprise. The progress we have made in this past year in program improvement, innovation and integration has helped set the stage for our transition to the new Academy. It is an exciting prospect indeed to be helping define the natural history museum of the twenty-first century and its educational role.

***Education Program Attendance***

| | |
|---|---|
| **Bioforum/teacher workshops** | **689** |
| **Junior Academy** | **422** |
| **Camp Academy (summer)** | **157** |
| **Adult and Family Courses** | **2595** |
| **Outreach** | **696** |
| **Lectures** | **5782** |

Robert Jenkins, *Director, Steinhart Aquarium*

This year has seen the Aquarium dispersed throughout the Academy as never before. The Venoms exhibit in Wattis Hall was almost a "mini-Steinhart" displaying a diverse set of venomous animals in habitats from around the world. Although they were temporary displays, we recreated totally different environments, requiring different humidities, temperatures, water requirements and lighting in an area not really suited for living displays. It was all a challenging engineering feat that the staff brought off very successfully.

In the new ScienceNow exhibit in Cowell Hall, we have maintained a series of living exhibits that change nearly every month. To do this we are developing a unique methodology that allows us to alter habitats quickly without harming the animal and plant specimens on display.

Meanwhile, many of our permanent exhibits have had another year of maturing. The live coral display continues to become more spectacular with each passing day and is now one of the best live coral exhibits in North America for its completeness and diversity of living corals. The concept of specimen diversity and display completeness is also carried over in an increasing number of our freshwater exhibits, where we are showing our green thumb by including more living plants than in years past. Appropriate, mature plant species are now included in these exhibits to provide a more natural habitat. Behind the scenes, aquatic biologist Mike Boyle has created an aquatic nursery system, a kind of intense herbiculture, that allows the Steinhart to grow many of its plant specimens.

Boyle and the other professionals on the Aquarium staff get enormous support from volunteers, which has helped make projects like the live plant system work really well. We also have folks who do the daily laboratory testing while others

*Steinhart Aquarium director Robert Jenkins examines a starfish, part of the Touch Tidepool exhibit, to make sure the animal gets enough rest and stays healthy.* Right: *One of our popular black-footed penguins.* Opposite: *The alligator swamp, the Academy's oldest continuous exhibit.*

take care of the animals and clean tanks. Some have even volunteered to do some thankless jobs like moving filter sand. The Aquarium simply would not be as successful as it is without its enthusiastic volunteers!

Another fascinating experiment this year has been Pamela Schaller's work with the giant Pacific octopus in the Farallon tank. She has added a whole behavioral enrichment aspect to our octopus husbandry program by incorporating problem-solving interactions with the animal while its tank is being cleaned. The octopus now actively interacts with Schaller and the volunteers who assist her, resulting in an animal that is engaged with the biologist in its environment, and is more interested in what's going on.

Exciting new additions are the Burmese vine snakes recently rediscovered and collected by the late Academy herpetologist Joseph Slowinski in Myanmar. Little was known about the life history or husbandry requirements of these snakes except that they eat fish. It's fascinating to watch them hang down over the water, coil themselves like a flat spring and then grow quiet, waiting to grab a passing goldfish. In their resting mode, they look very much like twigs and are quite difficult to find. It is great fun watching our visitors trying to find all 13 snakes in the exhibit.

Although the breeding program of the winter-run Chinook salmon is over, we still have many of this highly endangered species on display. We will continue to maintain this exhibit, exposing our visitors to the plight of these fish and what is being done to save them in the wild.

We continue to experiment with the display environments, working to improve the living conditions of the animals and to minimize the outbreak of diseases. For instance, in the Roundabout we've changed the way we use seawater to create a healthier environment while at the same time using less ocean water and less energy.

But after 77 years with the same basic physical infrastructure, one of our principal goals is just staying open and operational. The Steinhart is an elderly, well-used building scheduled to be rebuilt in the very near future, so a significant portion of our time, effort and resources goes into maintaining the building in a safe condition for visitors, staff and animals alike. So, when I watch the excitement and joy on the faces of our visitors discovering some new species or have a biologist tell me that another species has just bred here for the first time, I remember how important our job is and work a little bit harder to keep the Aquarium open now and in the future.

***Aquarium***

| | |
|---|---|
| **Specimens** | **13,000** |
| **Species** | **700** |
| **Research/breeding projects** | **4** |
| **Visiting scientists/students** | **1,200** |
| **Volunteers/hours** | **50/3,400** |

# The Living Universe

## STEVE CRAIG, *Chair, Morrison Planetarium*

Attendance rose significantly last year thanks in part to a new policy of selling Planetarium tickets at Museum entrances. Other factors affecting attendance include the subject matter of our sky shows and public interest sparked by media coverage of astronomical news.

We produced five new shows during the year 2000-2001. These included "Into the Depths of Night"; "The Living Universe"; "2001 Almanac" to start the new millennium (astronomers are sticklers); "Worlds Unseen," which featured extrasolar planets; and summer's feature show, "Dark Matters," which explored how the dark matters both for sky observers and as a concept in modern astrophysics.

We also produced five shows designed specifically for different grades. Our portfolio of school shows now includes "Starry Skies" for pre-school and kindergarten students; "Neighbors in Space," a show for first and second grade students; an improved version of "New Worlds" for the third and fourth grades; "Worlds Beyond Earth" for fifth and sixth graders; and "Extremes" for seventh through twelfth graders. Classroom materials—summaries, vocabulary lists, activities, worksheets, and information about the rest of the museum—are revised annually and sent to teachers to help prepare for their visit.

Traditionally, our school programming runs for nine months, but this year we extended the programs into July and August to accommodate year-round schools as well as summer camps. Over 2,000 persons attended this program, mostly from day camps. Also during the year, two special "Home School" days were held in conjunction with the Docent Department. This joint venture, the brainchild of Kathleen Lilienthal, was a big success and has become part of our regular programming.

This was a dynamic year for our lecture series. Buzz Aldrin gave a lecture on the future of civilian space travel and his new novel, The Return. Our eleventh successful year of Dean Lectures featured three storytelling lectures in the Summer—Lucinda deLorimier with "Splendid Skies Over North America: Tales Both Tall and Wide of Our Starry Nights," Mary Ellen Hill with "The Story of the Universe," and Olga Loya with "Sky Stories from Latin America." The Planetarium also sponsored four lectures on "Astronomy in the New Millennium" featuring Ray Villard, Dr. Robert Brunner, Dr. Michio Kaku, Dr. Anthony Aveni, and Joe Haldeman, and four lectures on "Astrobiology—The Origins of Life on Earth and Beyond" featuring Dr. David Deamer, Dr. Lynn Rothschild, Dr. Kenneth Nealson, and Dr. Chris McKay. Dr Kaku's lecture drew a capacity crowd.

We continue to hold popular concerts in the Planetarium, exciting mixes of live music and special visual effects. Meanwhile, as tastes change, Laserium ended its nearly 25 year run with long lines of fans on the Labor Day weekend.

Artist Lynette Cook organized an exhibit of her work depicting extrasolar planets for a display in Earth and Space Hall. The show included a traditional mechanical orrery showing the Sun, the planets and their moons. Chief Technician John Weight constructed an extrasolar orrery depicting a distant star with a large planet revolving around it, synchronized with a Doppler-shifting spectrum, to illustrate how astronomers detect extrasolar planets.

Above: *Steve Craig, Chair of Morrison Planetarium connects the ball of a Foucault Pendulum built at the Academy onto the suspension cable.* Left: *School kids enjoy one of the many Planetarium shows.*

***Planetarium***

| | |
|---|---|
| **Visitors** | **113,411** |
| **Students at school shows** | **45,413** |
| **Laserium shows** | **44** |
| **Total audience** | **4,899** |
| **Dean lecture attendance** | **2,326** |

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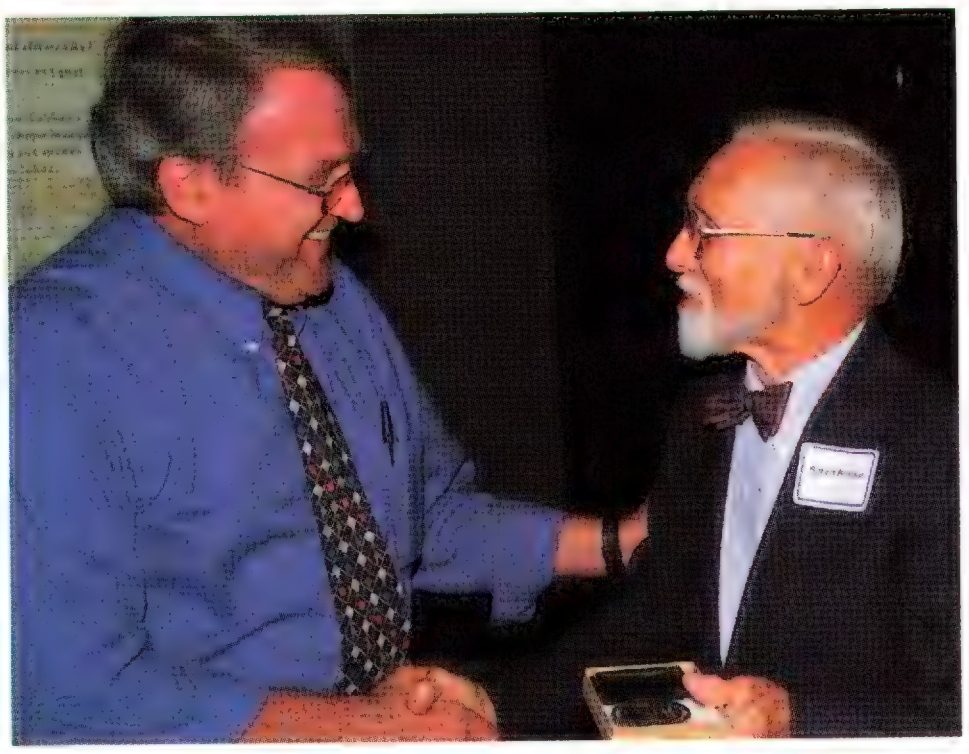

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Jean-Jacques Rafanomezantsoa
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Pascal Rabeson
Chrislain Ranaivo
Randriambololona Tantely
Nirina(Coco )
Hanitriniana Rasoazanamavo
Nicole Rasoamanana
Domoina Razafindratandra
Brinda Vavy

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Leticia Njozela
Madelyn Peters

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Amanda Grimes
Mike Johnson
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Molli MacDonald (to 5/01)
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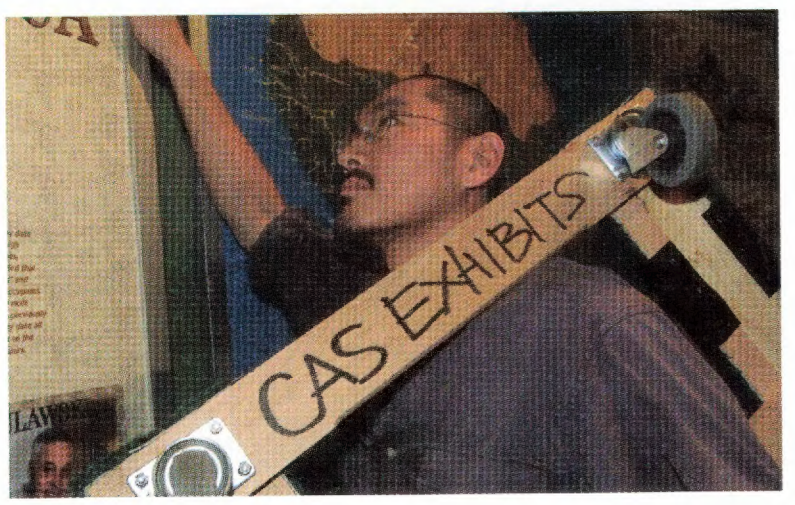
Top: *Luis Aguilar of the Academy Café, which is a member of the Green Restaurant Association committed to environmentally benign practices.*
Bottom: *Exhibit preparator Gen Hayashida.*

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### Pepperwood Ranch Natural Preserve

*Resident Biologist*
Michael Gilogly

# Balance Sheet

June 30, 2001 with comparative totals for June 30, 2000

| *Assets* | *Operating* | *Plant* | *Endowment* | *2001* | *2000* |
|---|---|---|---|---|---|
| Cash & Equivalents | 678,343 | 15,555 | - | 693,898 | 451,419 |
| Marketable Securities | 1,712,741 | 40,427,097 | 145,690,601 | 187,830,439 | 187,354,587 |
| Receivables: | | | | | |
| Research Grants | 215,198 | - | - | 215,198 | 305,721 |
| Other Grants | - | 981,078 | - | 981,078 | - |
| Interest & Dividends | 669,314 | 791,762 | - | 1,461,076 | 1,352,112 |
| Other | 92,332 | 4,424 | - | 96,756 | 394,516 |
| Contributions | 19,864 | - | 500,000 | 519,864 | 801,559 |
| Due (to) from other funds | (476,535) | (39,081) | 515,616 | - | - |
| Inventory | 359,152 | - | - | 359,152 | 473,509 |
| Prepaid Expenses | 344,210 | - | - | 344,210 | 253,258 |
| Investments Held in Trust | - | - | 4,478,555 | 4,478,555 | 4,809,123 |
| Property & Equipment at cost, less Accumulated Depreciation | - | 40,787,494 | - | 40,787,494 | 35,780,460 |
| **Total Assets** | **3,614,619** | **82,968,329** | **151,184,772** | **237,767,720** | **231,976,264** |
| ***Liabilities & Net Assets*** | | | | | |
| Accounts Payable | 853,072 | - | - | 853,072 | 497,662 |
| Accrued Expenses & Other Liabilities | 712,661 | 679,329 | 82,023 | 1,474,013 | 887,796 |
| Deferred Income | 199,310 | - | - | 199,310 | 233,619 |
| Annuities Payable | - | - | 1,839,370 | 1,839,370 | 2,097,903 |
| **Total Liabilities** | **1,765,043** | **679,329** | **1,921,393** | **4,365,765** | **3,716,980** |
| ***Net Assets: Unrestricted*** | | | | | |
| Available for Operations | 317,926 | - | 9,758,500 | 10,076,426 | 8,992,364 |
| Designated for Long-Term | - | 40,787,494 | - | 40,787,494 | 35,780,460 |
| Designated for Endowment | - | - | 111,687,504 | 111,687,504 | 121,465,452 |
| **Total Unrestricted** | **317,926** | **40,787,494** | **121,446,004** | **162,551,424** | **166,238,276** |
| Temporarily Restricted | 1,531,650 | 41,501,506 | 2,059,197 | 45,092,353 | 41,274,534 |
| Permanently Restricted | - | - | 25,758,178 | 25,758,178 | 20,746,474 |
| **Total Net Assets** | **1,849,576** | **82,289,000** | **149,263,379** | **233,401,955** | **228,259,284** |
| **Total Liabilities & Net Assets** | **3,614,619** | **82,968,329** | **151,184,772** | **237,767,720** | **231,976,264** |

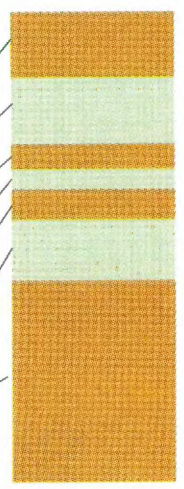
# Statement of Activities

Year ended June 30: 2001 and 2000

| *Changes in Net Assets* | *Operating* | *Plant* | *Endowment* | *2001* | *2000* |
|---|---|---|---|---|---|
| ***Revenue & Gains*** | | | | | |
| Admissions | 2,866,659 | - | - | 2,866,659 | 2,994,839 |
| Contributions | 4,028,428 | 2,546,300 | 6,194,222 | 12,768,950 | 33,314,266 |
| Memberships | 1,009,342 | - | - | 1,009,342 | 1,079,169 |
| Tuition & Program Fees | 895,616 | - | - | 895,616 | 868,832 |
| Auxiliary Activities | 1,714,614 | - | - | 1,714,614 | 1,773,149 |
| Government Grant Income | 799,272 | 3,913,222 | - | 4,712,494 | 1,788,834 |
| City & Co of San Francisco | 2,200,388 | - | - | 2,200,388 | 2,178,304 |
| Investment Income | 231,828 | 2,819,901 | 3,535,277 | 6,587,006 | 4,457,585 |
| Net Realized & Unrealized Gains on Investments | (107,772) | 1,217,345 | (4,016,573) | (2,907,000) | 18,654,959 |
| **Total Revenue & Gains** | **13,638,375** | **10,496,768** | **5,712,926** | **29,848,069** | **67,109,937** |
| ***Expenses*** | | | | | |
| Research | 6,731,292 | 548,712 | - | 7,280,004 | 6,200,169 |
| Public Programs | 6,031,800 | 573,795 | - | 6,605,595 | 7,112,217 |
| Aquarium | 3,349,372 | 318,252 | - | 3,667,624 | 3,594,845 |
| Development & Membership | 2,359,240 | 466,100 | - | 2,825,340 | 3,101,516 |
| Auxiliary Activities | 1,490,098 | 61,142 | - | 1,551,240 | 1,510,960 |
| Management & General | 2,250,658 | 524,937 | - | 2,775,595 | 3,136,227 |
| **Total Expense** | **22,212,460** | **2,492,938** | - | **24,705,398** | **24,655,934** |
| ***Transfers Between Funds*** | | | | | |
| Capital Expenditures | (699,637) | 699,637 | - | - | - |
| Other Transfers | 9,020,879 | 165,294 | (9,186,173) | - | - |
| **Increase/(Decrease) in Net Assets** | **(252,843)** | **8,868,761** | **(3,473,247)** | **5,142,671** | **42,454,003** |
| **Net Assets Beginning of Year** | **2,102,419** | **73,420,239** | **152,736,626** | **228,259,284** | **185,805,281** |
| **Net Assets End of Year** | **1,849,576** | **82,289,000** | **149,263,379** | **233,401,955** | **228,259,284** |

***Revenue & Transfer: $22.7 million***

| | *$ Millions* | *Percent* |
|---|---|---|
| Admissions | $2.9 | 12.8% |
| Contributions | 4.0 | 17.6% |
| Memberships | 1.0 | 4.4% |
| Tuition & Program Fees | 0.9 | 4.0% |
| Auxiliary Activities | 1.7 | 7.5% |
| Government | 3.0 | 13.2% |
| Investment & Endowment Transfer | 9.2 | 40.5% |
| | 22.7 | 100.0 |



***Operating Expenses: $22.2 million***

| | *$ Millions* | *Percent* |
|---|---|---|
| Management & General | $2.3 | 10.4% |
| Auxiliary Activities | 1.5 | 6.8% |
| Development & Membership | 2.4 | 10.8% |
| Aquarium | 3.3 | 14.9% |
| Public Programs | 6.0 | 27.0% |
| Research | 6.7 | 30.2% |
| | 22.2 | 100.0 |

ACKNOWLEDGEMENTS

*Program Manager:* Keith Howell
*Art Direction:* Susan Schneider
*Editorial Assistant:* Suzanne Ubick
*Graphic Design/Production:* Linda Corwin
*Research:* Michele Wellck, Karren Elsbernd
*Photography:* Dong Lin

*Except*

Inside Front Cover (Volunteers) Volunteer Office
pg.4 (Terry Gosliner) David Behrens
pg.5 (ScienceNow - from top, left to right):
(heron flying) CAS Special Collections/Corsi,
(sudden oak death) U.C. Davis,
(glassy winged sharpshooter) U.C. Davis,
(treefrog) Robert Drewes, (kiosk/exhibit) Gail Hewson-Hull,
(rockfish harvest) John McCosker, (Mars) NASA,
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pg.6 Jenny Michael
pg.7 Jenny Michael
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(twayblade) Joseph Kinyon
pg.12 Joseph Kinyon
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(Camp Academy, top) Katie Liermann
(Camp Academy, bottom) Leslie Quillin
pg.16 Lynette Cook
pg.17 (Steve Craig) Sally Syme
(Planetarium audience) Caroline Kopp
pg.19 Charlotte Fiorito, Weber Shih
pg.23 Caroline Kopp, Michael O'Callahan

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*Expedition to Yunnan*

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